Appendix A
WSDOT's Linear Referencing System

WSDOT's Linear Referencing System (LRS) is a one-dimensional referencing system used to uniquely identify each state route and to locate features along a route by their distance in miles from its beginning. An overview of the LRS is provided below.

SRID

Each state route in Washington State is identified using a unique alpha-numeric State Route ID (SRID). This, in turn, is composed of a State Route number (SR), Related Route Type (RRT) code, and a Related Route Qualifier (RRQ).

SR and RRT

Each Interstate, U.S. Highway, and Washington State Highway is identified by a three-digit State Route number (SR). Non-mainline portions of these (such as ramps) are also given a two character RRT code. RRT codes include:

AR: Alternate Route
CO: Couplet
RL: Reversible Lane(s)
SP: Spur
HI: Grade Separated HOV Lane(s) where traffic flows in the increasing direction of mainline mileposting
HD: Grade Separated HOV Lane(s) where traffic flows in the decreasing direction of mainline mileposting
FI: Frontage Road where traffic is adjacent to the increasing direction of mainline mileposting
FD: Frontage Road where traffic is adjacent to the decreasing direction of mainline mileposting
CI: Collector Distributor where traffic flows in the increasing direction of mainline mileposting
CD: Collector Distributor where traffic flows in the decreasing direction of mainline mileposting
LX: Crossroad within an interchange if the crossroad is not part of a mainline state route, spur, couplet or alternate route

Ramp RRTs are:

P1: Standard off-ramp from the side of the route carrying traffic in the increasing direction of mileposting

P2-P4: Consecutive numbering of off-ramps from the P1

P5: Cloverleaf off-ramp from the side of the route carrying traffic in the increasing direction of mileposting

P6-P9: Consecutive numbering of off-ramps from the P5

Q1: Standard on-ramp to the side of the route carrying traffic in the increasing direction of mileposting

Q2-Q4: Consecutive numbering of on-ramps to the Q1

Q5: Cloverleaf on-ramp to the side of the route carrying traffic in the increasing direction of mileposting

Q6-Q9: Consecutive numbering of on-ramps to the Q5

R1: Standard off-ramp from the side of the route carrying traffic in the decreasing direction of mileposting

R2-R4: Consecutive numbering of off-ramps from the R1

R5: Cloverleaf off-ramp from the side of the route carrying traffic in the decreasing direction of mileposting

R6-R9: Consecutive numbering of off-ramps from the R5

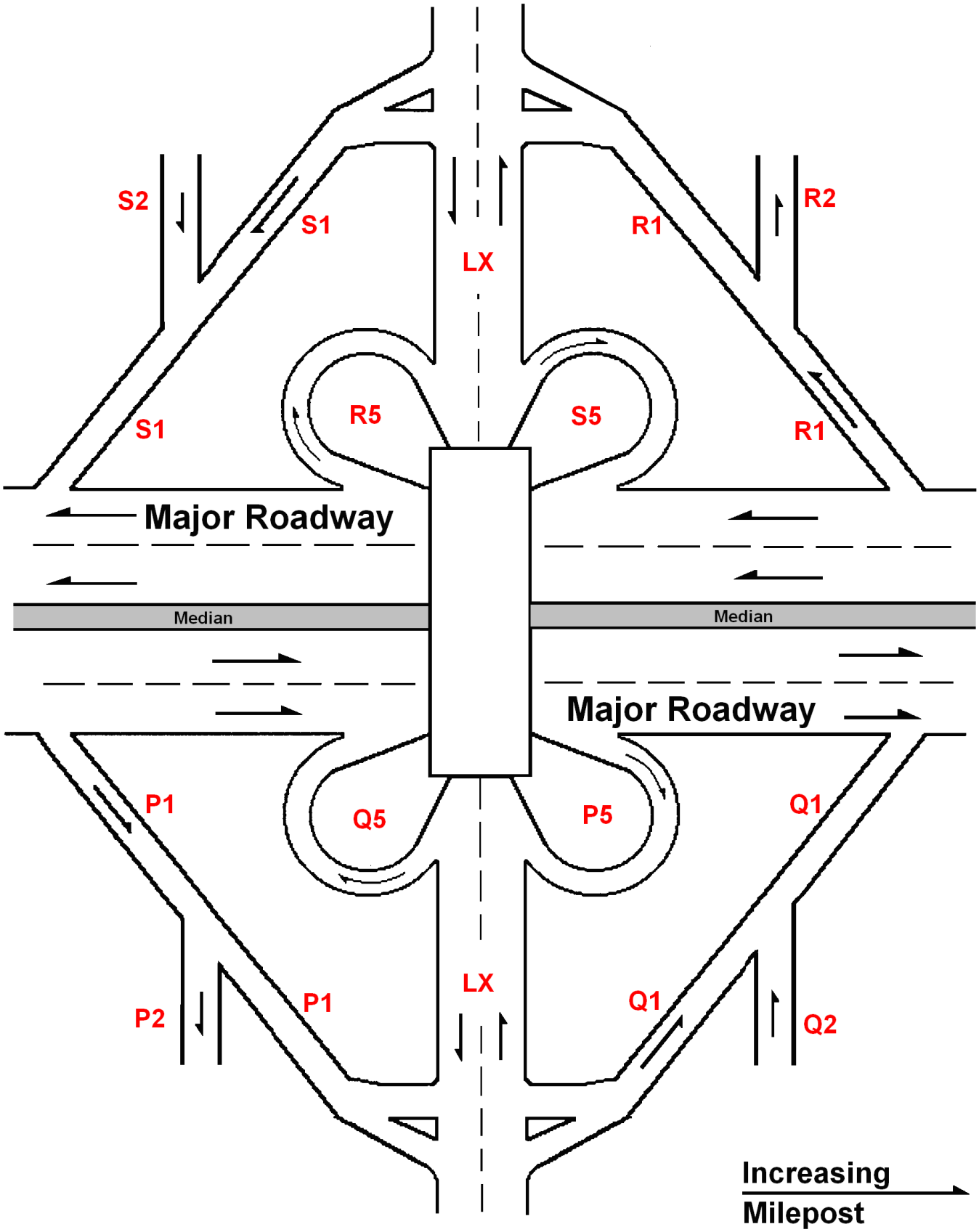
S1: Standard on-ramp to the side of the route carrying traffic in the decreasing direction of mileposting

S2-S4: Consecutive numbering of on-ramps to the S1

S5: Cloverleaf on-ramp to the side of the route carrying traffic in the decreasing direction of mileposting

S6-S9: Consecutive numbering of on-ramps to the S5

Examples of some of these are shown on the following page.


S2
S1
LX
R1
R2
S1
R5
S5
R1
Major Roadway
Median
Median
Major Roadway
P1
Q5
P5
Q1
P2
P1
LX
Q1
Q2
Increasing
Milepost

RRQ

Because multiple distinct roadways can often be defined by the same SR and RRT, an RRQ of up to six characters is used to further define portions of the state route system other than mainlines and alternate routes. In the case of couplets, spurs and reversible lanes, the RRQ is descriptive of the route (such as the city it is in or its local street name). In the case of collector distributors, frontage roads, grade separated HOV lanes and ramps that meet the mainline, the RRQ is the state route milepost (discussed below) of the point where the route meets the mainline (except that the decimal in the SRMP is dropped in creating the RRQ).[1, 2] For a ramp that does not meet the mainline, but instead meets another ramp, the RRQ of the ramp it meets is used. For other ramps and frontage roads, the RRQ is the state route milepost (without the decimal) of the point on the mainline nearest to where the ramp or frontage road begins (in the case of R ramps, P ramps and FIs) or ends (in the case of Q ramps, S ramps and FDs). For LXs, the RRQ is the state route milepost (without the decimal) of the point on the mainline where the LX crosses it.

ARM and SRMP

ARM

Within the system discussed above, each SRID is considered a route unto itself. Features of a route are coded within WSDOT's databases in terms of their linear distance from the start of that route. These features include:

- physical features such as bridge seats, undercrossings and intersecting roads;
- jurisdictional boundaries such as city limits and county lines; and
- changes in the number of lanes, pavement type, et cetera.

The distance of a feature from the beginning of the route, to the nearest 100th of a mile, is its Accumulate Route Mileage (ARM) value.

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[1] Although the term "mainline" is used in this sentence and those that follow, technically the RRQ of one of these types of routes is defined in terms of the state route milepost value of whatever major roadway it is associated with. This is usually a mainline, but can also be an alternate route, spur, couplet or reversible lane.

[2] Ramps associated with reversible lanes, couplets, spurs or alternate routes are distinct in that their RRQs contain an "R", "C", "S" or "A" (respectively) after the milepost-based numeric string.

SRMP and Ahead/Back Indicator

Because the distance from the beginning of the route is marked with milepost paddles, a roadway feature is often described not in terms of its ARM value, but in terms of the State Route Milepost (SRMP) value associated with that ARM. At route inception, a feature's ARM and SRMP (which is also maintained in WSDOT's database to the nearest 100th of a mile) are the same.[3] However, it would be too costly and confusing to the public to redo the paddles on a route every time construction changed the route's length. So, while ARM values are adjusted as needed to accurately reflect the current physical length of a highway, SRMP values are usually not.[4]

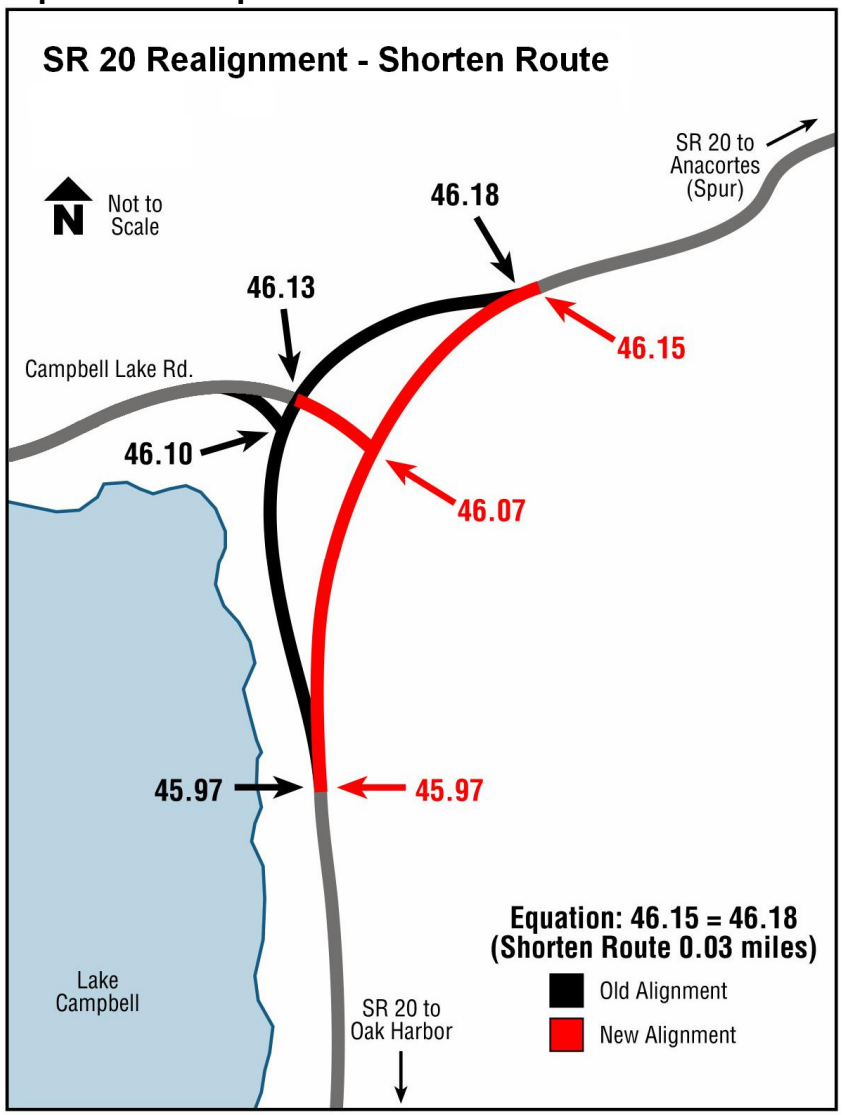
If the middle of a route is *shortened* through realignment or transfer of roadway from the state highway system to a local government, the resulting discontinuity in mileposting is reconciled within WSDOT's database through an equation at the end of the realignment or transfer. If the beginning or middle of a route is *lengthened* through realignment or jurisdictional transfer:

- SRMP values are provided for the new alignment sequentially from the SRMP where the realignment or transfer began;
- these SRMP values are given an Ahead/Back Indicator of "B" (instead of the standard "A") from the point that they reach the SRMP value equal to that of the end of the realignment or transfer; and
- the resulting discontinuity in mileposting is reconciled through an equation at the end of the realignment or transfer (e.g., 4.80B = 4.76A).

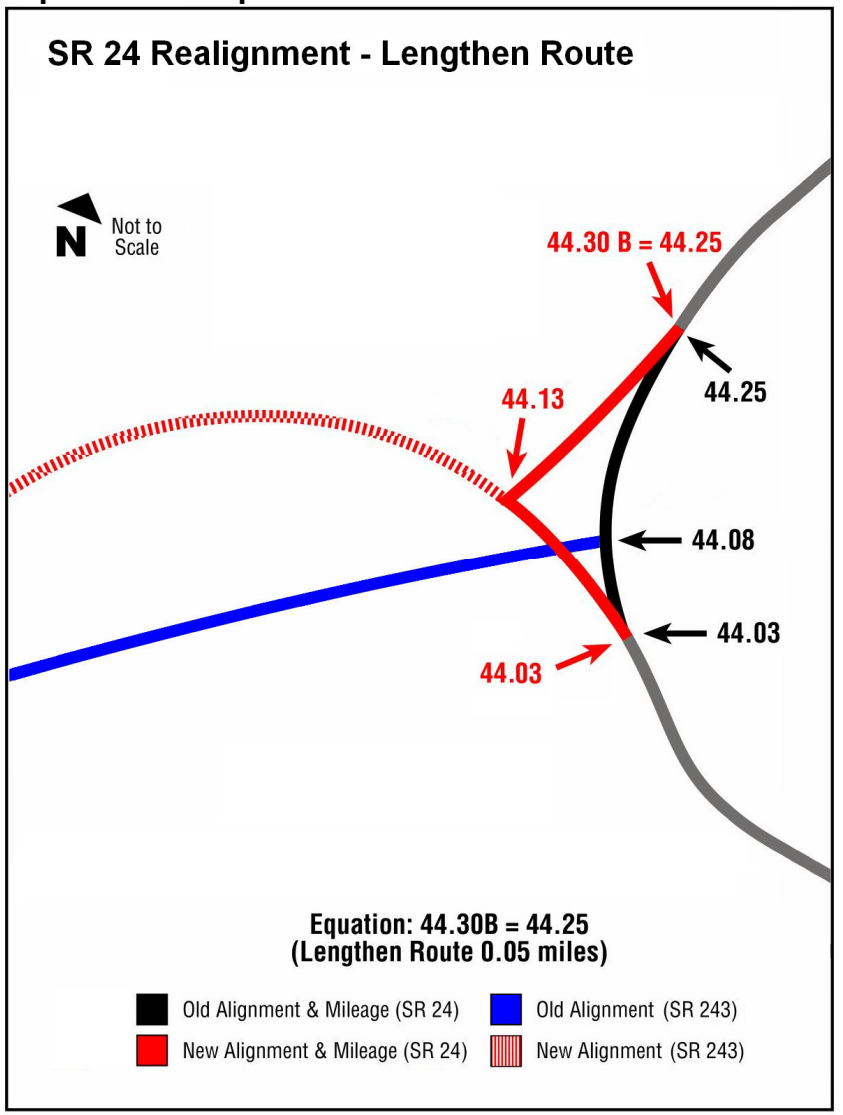
Examples of a route shortening and lengthening are shown on the left and right of the next page respectively. Note that these examples are typical of WSDOT reporting in that Ahead/Back Indicators are only shown when their value is equal to "B"

[3] Alternate routes, spurs, couplets and reversible lanes are an exception to this. The beginning of these routes are given an ARM of 0.00, but an SRMP equal to that of the point on the associated mainline where they intersect with it. I-205 is the sole mainline exception, having been mileposted continuously from Oregon through Washington.
[4] Features on ramps, frontage roads, collector distributors, LXs and grade separated HOV lanes have their SRMPs revised when the routes they are on change length. In extremely rare instances, this will occur on other types of routes as well.

Equation Example: SR 20 SRMP 46.15 = SRMP 46.18



Equation Example: SR 24 SRMP 44.30B = SRMP 44.25



Additional Roadway Feature Coding

Beyond their SRID and SRMP location, roadway features are given codes within WSDOT's database to further define their location in relation to the traveled way. These codes are incorporated into the feature descriptions found within the Location field of the Traffic Counts and ATR Counts databases. The meaning of each code is provided below.

Direction to Inventory Codes

These codes are provided for features that occur *on* the roadway.

Increasing: Feature occurs on the side of roadway carrying traffic in the increasing direction of mileposting.

Decreasing: Feature occurs on the side of the roadway carrying traffic in the decreasing direction of mileposting.

Bothways: Feature occurs on both sides of the roadway.

Left/Right Indicator Codes

These codes are provided for features that occur *along the side* of the roadway.

Left: Feature occurs along the outer side of the portion of the roadway carrying traffic in the decreasing direction of mileposting.

Left Center: Feature occurs along the median side of the portion of the roadway carrying traffic in the decreasing direction of mileposting.

Center: Feature occurs between the two directions of travel.

Right Center: Feature occurs along the median side of the portion of the roadway carrying traffic in the increasing direction of mileposting.

Right: Feature occurs along the outer side of the portion of the roadway carrying traffic in the increasing direction of mileposting.

Bothways: Feature occurs along the outer sides of both the portion of roadway carrying traffic in the increasing direction of mileposting and the portion of roadway carrying traffic in the decreasing direction of mileposting.

Appendix B
WSDOT's Vehicle Classification Scheme

The following is the Federal Highway Administration's vehicle classification scheme. WSDOT "Single Unit Trucks" are classes 4 through 7, "Double Unit Trucks" are classes 8 through 10, and "Triple Unit Trucks" are 11 through 13.

1. **Motorcycles** (Optional) - All two or three-wheeled motorized vehicles. Typical vehicles in this category have saddle type seats and are steered by handlebars rather than steering wheels. This category includes motorcycles, motor scooters, mopeds, motor-powered bicycles, and three-wheel motorcycles. This vehicle type may be reported at the option of the State.
2. **Passenger Cars** - All sedans, coupes, and station wagons manufactured primarily for the purpose of carrying passengers and including those passenger cars pulling recreational or other light trailers.
3. **Other Two-Axle, Four-Tire Single Unit Vehicles** - All two-axle, four-tire vehicles, other than passenger cars. Included in this classification are pickups, panels, vans, and other vehicles such as campers, motor homes, ambulances, hearses, carryalls, and minibuses. Other two-axle, four-tire single-unit vehicles pulling recreational or other light trailers are included in this classification. *Because automatic vehicle classifiers have difficulty distinguishing class 3 from class 2, these two classes may be combined into class 2.*
4. **Buses** - All vehicles manufactured as traditional passenger-carrying buses with two axles and six tires or three or more axles. This category includes only traditional buses (including school buses) functioning as passenger-carrying vehicles. Modified buses should be considered to be a truck and should be appropriately classified.

NOTE: In reporting information on trucks the following criteria should be used: (1) Truck tractor units traveling without a trailer will be considered single-unit trucks. (2) A truck tractor unit pulling other such units in a "saddle mount" configuration will be considered one single-unit truck and will be defined only by the axles on the pulling unit. (3) Vehicles are defined by the

number of axles in contact with the road. Therefore, "floating" axles are counted only when in the down position. (4) The term "trailer" includes both semi- and full trailers.

5. **Two-Axle, Six-Tire, Single-Unit Trucks** - All vehicles on a single frame including trucks, camping and recreational vehicles, motor homes, et cetera, with two axles and dual rear wheels.
6. **Three-Axle Single-Unit Trucks** - All vehicles on a single frame including trucks, camping and recreational vehicles, motor homes, et cetera, with three axles.
7. **Four or More Axle Single-Unit Trucks** - All trucks on a single frame with four or more axles.
8. **Four or Fewer Axle Single-Trailer Trucks** - All vehicles with four or fewer axles consisting of two units, one of which is a tractor or straight truck power unit.
9. **Five-Axle Single-Trailer Trucks** - All five-axle vehicles consisting of two units, one of which is a tractor or straight truck power unit.
10. **Six or More Axle Single-Trailer Trucks** - All vehicles with six or more axles consisting of two units, one of which is a tractor or straight truck power unit.
11. **Five or fewer Axle Multi-Trailer Trucks** - All vehicles with five or fewer axles consisting of three or more units, one of which is a tractor or straight truck power unit.
12. **Six-Axle Multi-Trailer Trucks** - All six-axle vehicles consisting of three or more units, one of which is a tractor or straight truck power unit.
13. **Seven or More Axle Multi-Trailer Trucks** - All vehicles with seven or more axles consisting of three or more units, one of which is a tractor or straight truck power unit.

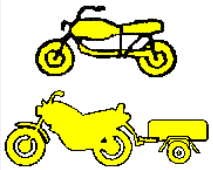
ALL OTHER

SINGLE UNITS

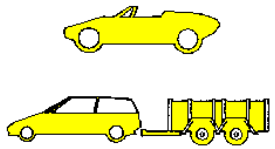
DOUBLE UNITS

TRIPLE UNITS

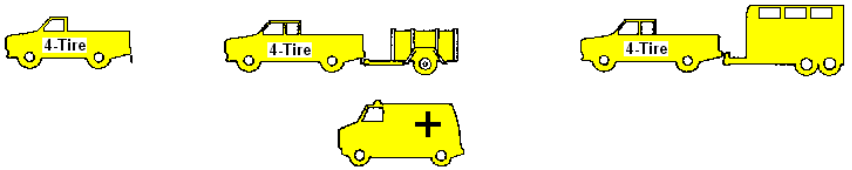
1 Motorcycles



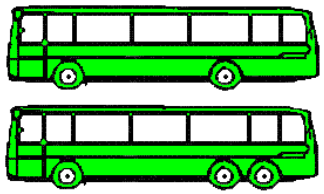
2 Passenger Cars



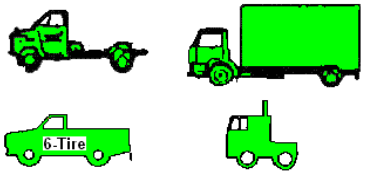
3 Two Axle, 4 Tire Single Units



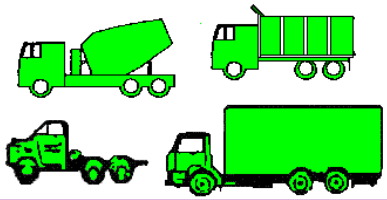
4 Buses



5 Two Axle, 6 Tire Units

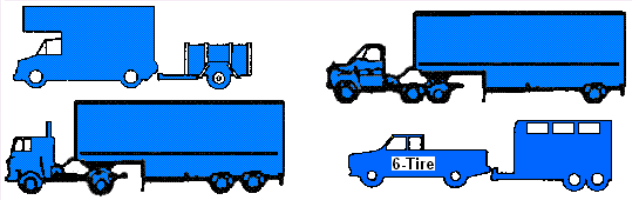


6 Three Axle Single Units

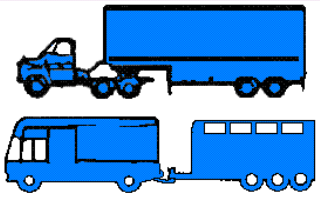


7 Four or More Axle Single Units

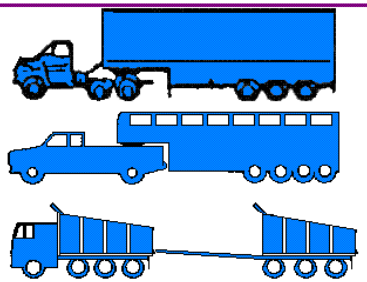
8 Four or Less Axle Single Trailers



9 Five Axle Single Trailers



10 Six or More Axle Single Trailers



11 Five or Less Axle Multi-Trailers

12 Six Axle Multi-Trailers

13 Seven or More Axle Multi-Trailers